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METEOROLOGICAL DEPARTMENT

INDIA WEATHER REVIEW, 1955

ANNUAL SUMMARY

PART B

SNOWFALL

CONTENTS

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Under the Direction of

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INDIA WEATHER REVIEW, 1955

ANNUAL SUMMARY

PART B

SNOWFALL

This part contains a summary of the reports of snowfalls in the mountain ranges to the north of India based on (a) records of snowfall observations made at the observatories and (b) reports collected by local officers from the local residents, headmen of villages or from travellers who passed through the region.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in feet and inches. At places provided with raingauges the snow collected in the gauge is melted and measured as rain. This is indicated in the text and the measurements are given in inches and cents.

Cold Weather Period, January and February

I.—JAMMU AND KASHMIR

Dras.—A few light snowfalls occurred during the period. The accumulations at the end of the period were about 1 to 1½ ft. All the peaks around were covered with snow. The falls during the period were below normal.

Srinagar.—Widespread but light snowfalls occurred frequently during the period. Hardly one foot of snow remained unmelted on the mountain ranges at the end of the period. The snowfall and the accumulation were below normal.

Kargil.—During January, nine snowfalls occurred, extending to the mountain ranges around. The depth of falls varied form ½″ to 2″ at the station and ½′ to 1½′ on the ranges. February witnessed only one fall amounting to about 1″ at station proper. Snow accumulations at the end of the period were about 15′ on the surrounding mountains. The falls during the period were below normal while the accumulations on the peaks at the end of the period were above normal.

Sonemarg.—Snow fell on seven days in January. Five of these falls varied from 2″ to 6″ and those on the 6th and 30th were to a depth of about 1′. The snow line descended occasionally to the Zojilla and Nichnay passes. In February snow fell on the 28th to a depth of 1′. At the end of the period, the accumulation on the Zojilla and Nichnay passes was about 4′ deep, while at the station it was about 1½′. The snowfall and accumulation were distinctly below normal.

Leh.—Two spells of snowfall, each lasting for a period of about a week, occurred in January. In February there were two light falls mainly confined to higher elevatious with a few flakes reaching the ground. There was no accountable snow at the station at the end of the period whereas about 3′ to 6′ of snow was observed on the peaks. The fall during the period and the accumulation at the end were below normal.

Patnitop (Batote).—Snow fell on thirteen days in January and on two days in February. The falls extended to some of the surrounding peaks where it was reported to be occasionally heavy. The snowfall was less than normal.

II.—THE PUNJAB (I)

Chamba District

Upper Chamba Range.—Snow fell on seven days in January and on three days in February. The snow line descended to about 5,000′ a.s.l. The following table shows the depth of the falls during and the accumulations at the end of January and February.

Pass	Falls		Accumulations	
	January	February	January	February
Kundi . . .	6″to 1′	2″	2″	2″
Baliani . . .	3″to 2½′	½′	14′	16′
Bohar . . .	2″to 1′	½′	8′–3″	9′

The snowfall was below normal.

Lower Chamba.—Report for January was not received. During February, there were a few falls which deposited about 1′ of snow at Khajiar. The snow line descended to 5,000′ a.s.l. The snowfall was reported to be below normal.

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Kalatope.—Snow fell on twelve days in January extending to the surrounding mountains as well. The depth of the falls on five out of these days exceeded 1′. In February, two snowfalls occurred, each depositing about 1′ of snow. The snowfall was below normal.

Snow accumulations at the end of each month were as follows :—

Pass	January	February
Dia Kund	12′	2′—6″
Basaldhani	5′ to 6′	..
Karadanda	..	1′—6″
Lakan Mandi	..	2″

Pangi Range (Kilar).—It snowed at Kilar on twelve days in January, the depth of the individual falls varying between 1″ and 1′. February witnessed four snowfalls. The total depth amounted to 6″. Snow accumulations at the station and on the higher passes were about 1′ and 20′ respectively at the end of the period. The snowfall was distinctly less than normal.

Trehta.—January and February witnessed fifteen and five snowfalls respectively. The snow line descended to about 4,000′ a.s.l. in January. The snowfall was below normal.

Bharmaur.—Report for January was not received. It snowed on six days in February to a total depth of 1′ 9″. The snow line descended to about 5,000′ a.s.l. The adjacent passes and peaks remained covered with deep snow. The snowfall was below normal.

Bhandal.—Report for January was not received. During February, it snowed on the 1st and 10th, the depth of the falls being 3″ and 1½′ respectively. The snowline descended to 4,000′ a.s.l. On the last day of the month 5′ snow lay unmelted on the Padri pass. The snowfall was distinctly below normal.

Chhatri.—Report for January was not received. It snowed on two days in February. The snowline descended below 5.000′ a.s.l., 4″ of snow at Chhatri and 3′ to 16′ on the Drati pass were left as residue at the end of the period. The snowfall was below normal.

Tissa.—Widespread snowfall occurred on four days in January. The depth of each fall was less than 5″. No snow fell during February. On the last day of the period the unmelted residue was estimated at about 6′ on the Sach pass. Snowfall during and accumulation at the close of the season were below normal.

Bhattiyat.—Three moderate to heavy snowfalls occurred in January at the station and on the adjacent high mountain ranges. About 4′ of snow was remaining unmelted at the close of the month at Kharadunda Joti. The snowfall was above normal. Report for February was not received.

Mahasu District

Nichar.—January witnessed seven falls, amongst which three falls were somewhat heavy, depositing about 1′ to 2′ of the snow at the station. The snow line descended to about 3,000′ a.s.l. During February, snow fell on the 11th to a depth of 3″. At the end of the period, snow residue to the extent of 3″ was observed at the station and to the extent of about 10′ to 12′ on the higher peaks. The snowfall and accumulation were below normal.

Kilba Kailash Range.—The following table shows the total amount of falls at the end of each month :—

Station	January	February
Kilba	3′–3″	2″
Sangle	4′–8″	5″
Purbani	4′–¼″	6¼″

On the last day of the period about 8′ of snow was observed on the Rupar, Basan and Shethal passes. The snowfall was below normal.

Pandrabis.—Snow fell on eight days in January and on three days in February, depths varying from 3″ to 9″. The snow line descended to about 3,000′ a.s.l. At the end of the period about 8″ of snow still lay unmelted at the station, while the snow was as deep as 10′ on the higher peaks like the Shrikhand. The snowfall was reported to be in excess of normal.

Pabar Range.—January witnessed several moderate to heavy snowfalls. The depth of falls measured at Khadrala and Bashla was about 2′ occasionally. During February, snow fell on four days to a total depth of 1¼′ at Khadrala. The snowfall was below normal.

Chini (Kalpa).—Snow fell on nine days in January and on three days in February to depths varying between 1″ and 9″ on each occasion. About 2′ of snow remained unmelted at the close of the period. The snowfall was below normal.

Chopal.—It snowed on ten days in January with heavy falls of 18″ and 24″ on the 23rd and 24th and on two days in February. The depth of the individual falls varied in January between 3″ to 4″ and 2″ to 3″ in February. The snow accumulations in the plains were about 4″, with a little deeper accumulation at places. About 1½′ of snow was observed to remain as residue on the higher passes. The snowfall was below normal.

Kumarsain.—It did not snow in the valley but the adjacent higher peaks and passes received normal snowfall during the period.

Suni.—Widespread snowfalls occurred on five days in January and on two days in February. The Shali peak (9,000 ft.) had an accumulation of about 2½′ of snow at the end of the period. The snowfall was less than normal.

Shilaroo.—It snowed on twelve days in January. The snowfalls of the 11th and 23rd were somewhat heavy and their respective amounts were 1′ 5″ and 1′ 8″.

Rampur.—January witnessed eight snowfalls, while February had only one. The snow line descended to 3,000′ a.s.l. in January. About 3′ of snow was left over on the Drarangali and Hatu peaks at the close of the period. The snowfall was about normal.

Parala.—Snow fell on the 12th and 24th January to depths of 3″ and ¾″ respectively. At Theog and Phagu about 2′ of snow fell on those two days. Snowfall was above normal during January. Report for February was not received.

Kotkhai.—It snowed on eleven days in January, depositing about 4′ snow on the adjacent higher peaks. During February, no snow fell. Snowfall was slightly in excess of normal during the season.

Jubbal.—Snowfall occurred on four days in January, extending to the surrounding mountain ranges. The depth of the individual falls varied from 2′ to 6′ on the Kara Pather pass. During February, it snowed on three days. The Kara Pather pass had comparatively scanty snowfall. The snowfall was about normal.

Solan.—During January, one snowfall occurred on the 12th. The snow, melted and measured, amounted to 1″. Another light fall occurred on the 24th but melted away as it fell to the ground. February witnessed two snowfalls one of which amounted to 6″. The snowfall was normal.

Arki.—No snow fell.

Rohru.—Snow fell on seven days in January extending to the surrounding mountain ranges. The snow line descended to about 4,000′ a.s.l. where about 4″ of snow was deposited. During February, no snow fell. The snowfall was reported to be below normal.

Kangra District.—A few light widespread snowfalls occurred during the period. The snow line descended to 5,500′ a.s.l. in February. The depths of accumulations at the end of the month are given below :—

Tahsil	Pass	January	February
		ft.	ft.
Palampur	Amar	15	16
	Saugar	15	16
	Swar	15	16
Kulu	Hamta	32	33
	Rohtang	28	36
	Bashleo	20	21
	Jalori	15	19

The fall was slightly above normal.

Seraj.—Report for January was not received. During February, a few falls occurred on the surrounding mountains. About 6′ to 12′ of accumulations were observed on peaks at the close of the season. The snowfall was reported to be less than normal.

Kulu.—Falls were mainly confined to the higher peaks and passes during the period. The snow accumulations on the Hamta, Rohtang and Barshai peaks were more than 10′ and less than the accumulation on the rest of the peaks and passes around. Snowfall was slightly in excess of normal during the season.

Sirmur District.—Snow fell on the higher ranges on 7 days in January to a total depth of about 2′. Report for February was not received.

Mandi District

Mandi.—Snow fell on seven days in January to average depths varying from 4″ to 10″ in the plains and 6″ to 18″ at a few places on the Nachan range. The first fortnight of February witnessed frequent moderate snowfalls, while there was no snowfall in the second fortnight. The depth of falls varied from 4′ to 6′ on the Shikari, Tungasi, Chunjala and Raigarh peaks. The following table shows the depth of accumulations at the close of each month :—

Peaks	January	February
	ft.	ft.
Shikari	9	6
Tungasi	6	5
Raigarh	7	4
Chet Galu	5½	..
Bhuboo	4½	1½
Tunga Devi	3½	1½
Chunjala	..	4

The snowfall was normal.

Suket.—It snowed on three days in January and February. The depth of the individual falls varied from 1″ to 12″. At the end of the period, about 5′ to 6′ snow remained unmelted in the Galtoo, Kannih and Meg peaks. The snowfall was below normal.

III.—UTTAR PRADESH

Garhwal District.—There were twenty moderate snowfalls at the station in January, with depth of the individual falls varying from 1½′ to 3′ on higher elevations. February witnessed seven light snowfalls. The snowfall was above normal.

Tehri-Garhwal District.—Widespread light snowfal occurred on three days in January and on two days in February. The depth of falls was about 5′ on higher elevations. The snow line was generally between 3,000 and 4,000′ a.s.l. At the close of the period abou 5′ of snow remained unmelted on the high peaks. The snowfall was below normal.

Almora District.—The following table shows the depth of falls during and accumulations at the end of January and February :—

Locality	January	February
	ft.	ft.
Falls		
Malla Danpur	5 to 22	6 to 22
Malla Johar	3 to 6	½ to 4
Malla Darma	10	1
Byans	9 to 13	3 to 4
Chaudans	2½	2½
Accumulations		
Kautela hill	7	6
Kautela Valley	8	7
Kafani hill	11	10
Kafani Valley	12	11
Bankatia hill	18	16
Bankatia Valley	20	18
Pinder Peak	22	20
Pinder Valley	25	22
Nanda Khat hill	25	20
Nanda Khat Valley	30	22
Sunder Dhunga Peak	20	18
Sunder Dhunga Valley	22	20
Unch Dhura	6	4
Ralam Dhura	4	2
Panchachuli	10	..
Nabai Dhura	10	..
Lipu	9½	3½ to 4½
Lampia	13	4½

The falls were slightly less than normal during the period, while the accumulations were normal.

Mukteswar.—It snowed on six days in January to depths of 1″ to 4″. February experienced only one snowfall. The snowfalls generally extended to the surrounding mountains as well. The falls were below normal.

IV.—ASSAM

Kameng.—Moderate snowfall occurred on a few days in January and February. The snow line was between 11,000′ and 12,000′ a.s.l. Accumulations of snow at the end of the period were 2′ at Mago and Tawang and 1′ at Sela and Bumula. The snowfall was normal.

Siang.—Report for January was not received. During February, snow fell on two days to a depth of about 2″ to 6″ on the average. The depths of snow at the close of the period at Nyugla, Chatak and Takuk were 4½′, 4′ and 3′ respectively. The snowfall was below normal.

Hot Weather Period—March to May

I.—JAMMU AND KASHMIR

Dras.—Heavy continuous snowfall occurred during the second half of March. The depth of the individual falls varied between 6″ and 20″. Snow accumulated to a depth of 4′ at the station at the close of the month. Snow fell on five days in April to a depth of 4″ to 8″. There were only a few light snowfalls in May. Throughout the period, the mountains around remained covered with snow. The snowfall was normal.

Srinagar.—During the period, there were light to moderate snowfalls, mainly confined to the adjacent mountains. On the 13th April, the station proper also experienced moderate snowfalls, precipitation amounting to 1 inch and 13 cents. About 1′ of snow remained unmelted on the ranges at the end of March. The falls were above average during the period.

Gulmarg.—Reports for March and April were not received. In May, light to moderate snowfall occurred on the Handibal and Apharwat ranges on six days, out of which, for three consecutive days from the 9th, it snowed at the station. The snowfall was appreciably above normal, while the snow accumulations on the mountains were below normal.

Kargil.—Snow fell on eight days in March to a depth of 1′ to 2′ on the ranges and 2″ to 4″ at the station. Report for April was not received. In May, there were two significant falls, each of them depositing about 1′ to 3′ snow on the peaks and passes and about 3″ to 6″ at the station. About 15′ of snow accumulation existed on the surrounding hills at the close of the season. The falls during the period were above normal.

Sonemarg.—There were twelve moderate to heavy snowfalls in the month of March, three light falls in April and one in May. Snow accumulations at the end of each month were 5′, ½′ and nil respectively. The snowfall was reported to be normal.

Leh.—Snow fell on eight days in March, extending to the mountain ranges. The snow line descended and remained at about 11,000′ a.s.l. throughout the month. Slightly heavier accumulations were observed on the high peaks and passes. During April, snowfalls were mainly confined to the higher mountain ranges. On the 21st and 30th, snow fell to a depth of 2″ and 1″ respectively at the station. The snow line generally remained at about 14,000′ a.s.l. May witnessed ten snowfalls on the adjacent hills, only a couple of them partly affecting the station proper. About 12′ to 15′ of snow remained unmelted on the peaks and passes at the close of the month. The falls were appreciably above normal during the season.

Patnitop.—There was one light snowfall in March and a heavy fall in April, both extending to the mountain ranges. The snow line descended from about 5,500′ a.s.l. in March to about 4,500′ a.s.l. in April temporarily. There was no residue of snow at the end of April. Snowfall was below normal in March and above normal in April. The report for May was not received.

II.—THE PUNJAB (I)

Chamba District

Upper Chamba Range.—Snow fell on five days in March and on nine days in April. Accumulations at the close of the period were as follows :—

Pass	March	April	May
	ft.	ft.	ft
Baliani	17	16	..
Bohar	10	8	..

The snow line descended to about 4,000′ a.s.l. in March and was at 6,000′ a.s.l. in April. The report for May was not received. Snowfall was normal in March and above normal in April.

Lower Chamba.—Snow fell on one day in March to a depth of about 6″ and on two days in April, each day depositing about 2″ of snow. No snow fell in May. The snow line was at about 5,500′ a.s.l. during the period. The falls were below normal during the season.

Kalatop.—March and April witnessed two snowfalls each. The total depth of falls was about 1′ in each month. At the end of March, snow accumulations at Dian Kund, Karadanda and Lakar Mandi were respectively 1′, 8″ and 3″ while there was no snow left on the last day of April. Report for May was not received. The falls were below normal.

Pangi Range (Kilar).—There were twelve snowfalls in March, nine in April and one in May. Amount of snow during the falls in each month steadily decreased from about 6″ on the average in March to 4″ in May. About 10′ of snow remained unmelted at Sach pass (14,478′) at the end of the period. The snowfall was about normal during the period.

Trehta.—Snow fell on one day in March and twice in April. 2′ 4″ of snow was measured in March at Sutkan but melted away by the end of the month. The total snowfall in April amounted to 3″ in the plains. On the Jalasu and Kurusi passes about 3′ and 6′ of snow respectively was observed on the last day of April. The report for May was not received. The falls were below normal in March and above normal in April.

Bharmaur.—During March, snow fell on two days to a depth of about 2½′. The snow line descended to 5,000′ a.s.l. resulting in 8′ of snow accumulation at the Kugti, Chobhia and Kalichho passes at the close of the month. The falls were mainly confined to higher elevations. It snowed on three days in April, at the elevation of 8,000′ a.s.l., the depth of fall being about 2″. May witnessed several snowfalls. The depth of the individual falls varied between 2″ and 4″. Accumulations on the last day of May were about 4′ to 5′ at the Kugti, Chobhia and Kalichho passes. The falls were above normal.

Bhandal.—It snowed on two days in March, to a total depth of 5″ at the station. In April, two light snowfalls occurred amounting to about 4″. The snow accumulations of about 3′ at the Padri pass at the end of March were melted down to 1′ by the close of April. No snowfall occurred in May. The snowfall was below normal.

Tikri.—March witnessed one snowfall on the 2nd with about 3″ of snow deposited on the ground. On the Chhatri and Drati passes, about 1′ and 22′ of snow respectively remained unmelted at the end of March. Report for April was not received. During May, there was no snowfall. The falls were much below normal during the season.

Tissa.—About 4″ of snow fell at the station and about 3′ on the Sach pass during March. However, there was no residue of snow at the station on the last day of the month. During April, snowfalls were confined to higher elevations. There was no snowfall in May. At the end of April the accumulations on Sach and Chari passes were less than two feet. The falls were below normal.

Mahasu District

Nichar.—Snowfalls were confined to the summits of the adjacent mountains during March and May. April witnessed one snowfall about 1½″ deep. Snow accumulations at the station and on the peaks were respectively about 6′ and 12′, at the end of the period. Snowfall was above normal during the period.

Kilba Kailash Range.—The following table gives the total depth of the falls during the period :—

Station	March	April	May
Kilba	1″	..	..
Sangla	11″	7″	1″
Purbani	10″	5″	½″

The aggregate snowfall of March was estimated at 12′ at the Rupar, Buran and Shathal passes. The snow however melted quickly and there was no accumulation left by the end of April. Due to fresh falls in May, about 2′ of snow was observed to remain on these passes on the last day of the period. The falls were a little in excess of normal.

Pandrabis.—Snow fell to a total depth of 3″ during March and 5″ during April at Pancha, while May witnessed no snowfalls. About 7′ of snow remained unmelted on the Shrikhand peak on the last day of May. The snowfall was above normal.

Chini (Kalpa).—It snowed on four days each in March and April and on one day in May. April falls were comparatively heavy and the depth of the individual falls varied from 3″ to 6″. The snow line was above 12,000′ a.s.l. at the end of the period and all the passes were clear of snow. The snowfall was normal during the period.

Chopal.—No snow fell. Higher passes and peaks were bare of snow at the close of the period.

Kumarsain.—During March, snow falls were mainly confined to the high peaks and passes, where snow fell to a depth of about 3″. April witnessed two light falls. No snowfall occurred in May. The snowfall was below normal.

Suni.—No snow fell during March and April. The report for May was not received.

Shilaroo.—Reports for March and May were not received. No snow fell in April.

Rampur.—It snowed on six days in March and on four days in April. On the Daranghati and Hatu peaks, about 6″ of snow residue was observed at the close of April. There was no fall during May.

Parala.—There was no snowfall in March. Reports for April and May were not received.

Kotkhai.—No snow fell.

Iubahl.—There was no snowfall during March. Reports for April and May were not received.

Arki.—No snow fell.

Rohru.—No snow fell during March. Reports for April and May were not received.

Kangra.—Snowfalls were widespread and moderate during March and April. Report for May was not received. The snow line lowered to 4,000′ a.s.l. occasionally.

The depth of falls during and accumulations at the end of each month on the peaks are given below :—

Name of peak	Falls			Accumulations		
	March	April	May	March	April	May
	ft.	ft.	ft.	ft.	ft.	ft.
Hamta and Rohtang .	8	4	..	25	21	..
Chandrakhani . .	7	1	..	9	4	..
Shrikhand . .	2	1	..	13	22	..
Bashleo . . .	1	1	..	9	2	..
Jalori . . .	½	½	..	6	1	..

Snowfall was above normal during March and April. The accumulations were about normal in March and below it in April.

Seraj.—It snowed on a few days in March, extending to the peaks and passes around. On the last day of March, about 6′ to 12′ snow was observed to remain on certain peaks. The snowfall was below normal. Reports for April and May were not received.

Kulu.—Snowfalls were mainly confined to higher elevations. The depth of falls varied from about 5′ in March to about ½′ to 4′ in May on the peaks and passes around. Accumulation at the end of the period on the Hamta and Rohtang peaks was about 20′ while it varied from 1′ to 5′ on other peaks. The snowfall was above normal on the mountain ranges.

Sirmur District.—No snow fell.

Mandi District.—Heavy and widespread falls occurred on a few days in March and April extending to the Saraj and Kataula ranges where the depth of falls was of the order of 3 in. to 6 in. There was no snowfall in May. The accumulations on peaks at the end of March and April were as given below :—

Peaks	March	April
Shikari	4′	3′
Tungasi	2½′	2′
Karhiban	2′	6″
Bhuboo	6″	1″
Tunga Devi	6″	1″

The snowfall was above normal during the season.

III.—UTTAR PRADESH

Garhwal.—There were twenty-two snowfalls each in March and April and twenty-six in May. The residue of accumulations on the peaks above 11,000′ a.s.l. was about 2″ to 6″. The snowfall was above normal.

Tehri-Garhwal.—No snow fell.

Almora.—The following table gives the depth of falls during and accumulations at the end of each month :—

Locality	March	April	May
Falls			
Malla Danpur	2′ to 16′	2′ to 12′	Nil
Malla Johar	½′ to 1½′	1′ to 3′	1′
Malla Darma	½″	1′	5″
Chaudans	½″	2½′	Nil
Accumulations			
Kautela Hill	2′	2′	..
Kautela valley	3′	3′	..
Kafani Hill	8′	5′	..
Kafani Valley	10′	7′	..
Sankatia Hill	12′	8′	..
Pinder Peak	16′	8′	..
Pinder Valley	18′	10′	..
Nanda Khat	20′	12′	..
Munder Dhunga	14′	8′	..
Munder Dhunga Valley	16′	10′	..
Unch Dhara	1½′	3′	1′
Kalamdhura	½′	1′	½′
Nasurleg	..	10′	..

The falls during and the accumulations at the end of the season were below normal.

IV.—ASSAM

Kameng.—Moderate snowfall occurred on a few days in March and April, confined to the mountain ranges. The snow line descended to 10,500′ a.s.l. in March. Accumulation of snow at the end of March and April was about 2 ft. at Mago, Sela and Bumala. There was no snowfall in May. The snowfall was normal.

Southwest Monsoon Period—June-September

June-July

I.—JAMMU AND KASHMIR

Dras.—There was no snowfall during the period, except a few light falls on the high peaks during June. The snowfall was normal.

Srinagar.—It did not snow either in the valley or on the surrounding mountains. Mountain peaks of considerable elevation however, had a little accumulation at the end of the period. The snowfall was below normal.

Gulmarg.—There was no snowfall except for a few light falls on the high mountain ranges. The snowfall and accumulation were below normal.

Kargil.—As usual, no snowfall occurred during the period. At the end of the period, about 2′ of snow was observed on the high peaks.

Sonemarg.—As usual, it did not snow.

Leh.—There were six snowfalls in June and seven in July in the mountain ranges. The snow line was at about 13,000′ to 15,000′ a.s.l. during the period. About 1′ to 2′ snow remained unmelted at places above 18,000′.

II.—THE PUNJAB (I)

Chamba District

Upper Chamba Range.—No snow fell during the period at the station. However, some snow fell at places above 12,000′ a.s.l. About 3′ snow was reported to have accumulated on the peaks above 14,000′ at the close of the period. The falls were reported to be normal.

Lower Chamba.—No snow fell.

Pangi Range (Kilar).—There was no snowfall at the station proper. A few moderate snowfalls were reported from the Sach and Drati passes where the snow accumulations were 2′ and 3′ respectively at the end of the period. The snowfall was slightly in excess of normal.

Bharmaur.—No report was received for June. Snowfalls during July were restricted to the mountain ranges above 16,000′ a.s.l. Snow accumulations at the end of the period at the Kungti, Chobia and Kalichho passes were about 1′. The falls at higher elevations were distinctly above normal.

Bhandal.—No snow fell.

Tikri.—No snow fell.

Tissa.—No snow fell.

Mahasu District

Nichar.—There was no snowfall in June. About 11′ to 13′ of snow still lay unmelted on the peaks and passes at the end of June. Report for July was not received.

Kilba Kailash Range.—There was no snowfall. The snow line was at about 16,000′ a.s.l. Snow accumulation of about 1′ observed on the Rupan, Busan and Shathal passes at the end of June practically melted away by the end of July and these passes were open for traffic. Snowfall was below normal during the period.

Chini (Kalpa).—No snow fell.

Kangra District

Seraj.—Report for June was not received. As usual, no snow fell during July.

Kulu.—No snow fell.

Mandi District

Mandi.—As usual there was no snowfall.

Suket.—No snow fell.

III.—UTTAR PRADESH

Garhwal.—It snowed on eleven days in June. About 2" to 6" of snow still lay unmelted on the peaks above 19,000' a.s.l. on the last day of June. Snowfall was above normal in June. There was no snowfall in July.

Tehri-Garhwal.—No snow fell.

Almora.—The following table gives the depth of falls during and accumulations at the end of June and July :—

Locality	June	July
Falls		
Malla Danpur	Nil	Nil
Malla Johor	2"	Nil
Malla Darma	2"	2"
Chaudans	½'	..
Accumulations		
Untdhura	2"	4"
Ralamdhura	½"	1"
Masurleg	½'	..

The snowfall was about normal.

August-September

I.—JAMMU AND KASHMIR

Dras.—No snow fell.

Srinagar.—Two light falls occurred on the higher ranges during August. No snow fell in September. A few patches of snow remained as accumulation on the last day of September. The snowfall was normal.

Gulmarg.—No snow fell at the station. A slight snowfall was observed on the Handibal peak in September. The fall was below normal.

Kargil.—No snow fell.

Sonemarg.—No snow fell.

Leh.—It snowed on a few days in August on the ranges above 19,000' a.s.l. Peaks and passes were clear of snow.

II.—THE PUNJAB (I)

Chamba District

Lower Chamba.—No snow fell.

Pangi Range (Kilar).—No snow fell.

Bharmaur.—Report for August was not received. During September, snowfalls were confined to the high mountain ranges at and above 10,000' a.s.l.

Bhandal.—No snow fell.

Tikri.—No snow fell.

Tissa.—No snow fell.

Mahasu District

Kilba Kailash Range.—Report for August was not received. During September, snowfalls were confined to the peaks and passes above 14,000' a.s.l. The falls were above normal.

Chini (Kalpa).—No snow fell during August. Report for September was not received.

Rampur.—No snow fell.

Kangra District

Kulu.—No snow fell.

Mandi District

Mandi.—No snow fell.

Suket.—No snow fell.

III.—UTTAR PRADESH

Garhwal.—No snowfall occurred during August. September witnessed fourteen snowfalls. The aggregate snowfall of the month was estimated at about 4" to 1' above 15,000' a.s.l. Snowfall was above normal during September.

Tehri-Garhwal.—No snow fell.

Almora.—The following table gives the depth of falls during and accumulations at the end of each month :—

Locality	August	September
Falls		
Malla Danpur	Nil	4½" — 1½"
Malla Johar	Nil	1—4"
Mala Darma	4'	7—8'
Chaudans	4'	1—1½'
Accumulations		
Unchadhura	..	4"
Ralamdhura	..	3"
Lipulag	..	1'
Lampyaleg	..	1½'
Masurleg	..	1'
Bankatiya	..	1'
Pinder peak	..	1'
Nandakhat	..	1½'
Sunderdhunga	..	8"
Malla Darma	4'	..
Chaudans	4'	..

The snowfall was slightly in excess of normal.

Post-Monsoon Period—October-December

I.—JAMMU AND KASHMIR

Dras.—There were a few light snowfalls during December. Snowfalls during and accumulations at the end of the period were below normal.

Srinagar.—One light to moderate snowfall was observed on the surrounding mountains on the 6th October. During November there was no snowfall. There were four light snowfalls in December on the mountain ranges, only one of them reaching the station proper. The snow, melted and measured, amounted to 0.01". About 6" of snow was observed to remain on the mountain ranges at the close of the season. The falls during and accumulations at the end of the period were below normal.

Kargil.—But for a few falls on the mountain ranges o a depth of about 3′ in October, there was no snowfall luring the period. At the end of the period, however, here was no accumulation on the mountains. The snow-all and accumulation were below normal.

Sonemarg.—Snow fell on one day in October and n four days in December. There was no snowfall dur-ng November. October snowfall measured to a depth f ½″, while two of the falls in December were somewhat eavy, and left about 1′ of snow on the ground. The ggregate snowfall of the period in the plains was about

Gurez.—Reports for October and November were ot received. It snowed on six days in December. bout 6″ and 2′ of snow were left as residue on the plains nd peaks respectively.

Leh.—Snow fell on five days in October. About ½′ to 2′ of snow remained unmelted on the Kardung ass. No report was received for November. During ecember, there was one light fall on the 31st, extending lso to the mountain ranges. The snow line descended rom 15,000′ a.s.l. in October to about 13,000′ a.s.l. in ecember. Snow accumulated to a depth of about ½″ t the station and about 4′ and 1′ respectively at the eaks at 15,000′ and 18,000′. The snowfall was nor-ıal.

Patnitop.—Reports for October and November ere not received. December witnessed five snowfalls mongst which only those on the 22nd and 31st affected ıe station proper. The snow line descended to about ,000′ a.s.l. by the end of the month. About 3″ of snow as observed to remain unmelted at the station on the ıst day of the season. Snowfall was below normal for ıe season.

II.—THE PUNJAB (I)

Chamba District

Upper Chamba Range.—Widespread and moderate heavy snowfalls occurred on the surrounding moun-ıin ranges, including the Bohar, Baliani and Chali-ıorasi passes during October and December. No report as received for November. Snow accumulations at the ıd of the season were 2″ and 9″ at Bakani and Kundai spectively and about 1½′ to 3′ at the Bohar, Baliani ıd Chalichorasi passes. The falls were normal during ıe season.

Lower Chamba.—No snowfall occurred during ctober. Reports for November and December were ot received.

Kalatop.—Reports were not received for October ıd November. During December, there were four ıowfalls, of which the one which occurred on the 22nd as comparatively heavy and deposited 2′ 3″ of snow ı the ground. At the end of the season, 3′ 7″ of snow mained unmelted at the station. The snowfall was ormal.

Pangi Range (Kilar).—During the first fortnight of ctober, three heavy falls, with depths varying between ½′ and 4½′, occurred. The falls during the rest of the onth were comparatively light. There was no snowfall ıring November, while December witnessed six light lls. The snow, melted and measured, amounted to 10 nts on each occasion on an average. Snow residue of about 20′ was observed at the Sach pass on the last day of the season. The falls were slightly in excess of normal.

Trehta.—During October a few snowfalls occurred in between rains. No snowfall occurred during November. December snowfalls were mainly confined to higher elevations with two light falls reaching the station. The aggregate snowfall of the period was estimated at about 6′—8′ on the peaks and passes above 12,000′ a.s.l. The falls were normal.

Bharmaur.—Reports for October and November were not reecived. Snow fell on three days in December to a total depth of 2″. About 8′ to 9′ of snow accumulations were observed on the Kugti, Chobia and Kalichho passes on the last day of the season. The snowfall was reported to be below normal.

Bhandal.—No snow fell during October and November. During December it snowed on three days, the depths of individual falls varying from 6″ to 10″ in the plains. At the end of the period, 4′ and 5′ of snow remained unmelted on the Padri and Gangul passes respectively. The snowfall was below normal.

Tikri.—No snowfall occurred during October and November. It snowed on three days in December, the depths varying from 1″ to 4″. The snow line descended to 6,500′ a.s.l. About 10′ of snow was estimated to remain at the Drati pass at the end of the period.

Tissa.—No reports were received for October and November. December witnessed four snowfalls. The snow line was generally above 7,000′ a.s.l. The Sach pass had an accumulation of about 7′ of snow on the last day of the season. The falls were normal.

Bhattiyat.—No reports were received for October and November. It snowed on two days in December. The residue of accumulation at Surgdawari Dhen was about 1½′ and at Kharadanda about 6″. The falls were slightly less than normal.

Mahasu District

Nichar.—Report for October and November were not received. December witnessed two snowfalls—one on the 22nd, to a depth of 4″ and the other on the 31st to a depth of 1″. The snow line descended to 5,000′ a.s.l. The residue of snow at the close of the season on the higher elevations was about 2′. The falls were reported to be less than normal during the period.

Kilba Kailash Range.—A few falls, with depths varying from 2″ to 5″, occurred on the peaks and passes above 10,000′ a.s.l. during October. About 3′ of snow was reported to remain as residue at the Rupan, Busan and Shethal passes at the close of the month. Report for November was not received. During December, it snowed once at Kilba, on four days at Sangla and on there days at Purbani. The depth of falls varied between 1″ and 5″. The snow accumulations at the end of the period were estimated to be 5′ on the passes and peaks and 1″ at Kilba (7,200′). The falls were below normal in the valley and above normal at higher elevations during the period.

Pabar Range.—Reports were not received for October and November. December witnessed four snowfalls. The total depth of falls measured at Khadrala was 9″ and at Bashla 4″ The snowfall was reported to be below normal during the period.

Chini (Kalpa).—Reports for October and November were not received. During December, snow fell on five days to a total depth of 8". The snowfall was above normal.

Chopal.—Reports for October and November were not received. December witnessed two light snowfalls. The snow line descended to 6,000' a.s.l. About 6" of snow remained unmelted on the higher passes like the Kharki, Gala and Memdha Lani. The falls were normal.

Kumarsain.—There was no snowfall in October and November. During December snow fell on two days to a depth of about 2" on each day. The snow line descended to about 6,000' a.s.l. during the month.

Suni.—There was no snowfall in October and November. December witnessed one snowfall on the mountain ranges. The snowfalls were said to be below normal.

Rampur.—No snowfall occurred during October and November. It snowed on two days in December. About 3" of snow deposited on the higher peaks around by the end of the period.

Solan.—Snow fell on one day in December to a depth of 0.41". At the end of the season the peaks and passes were clear of snow.

Arki.—Reports for October and November were not received. No snowfall occurred in December.

Rohru.—Reports for October and November were not received. Some flakes were observed to fall on the high peaks during December. About 2' to 3' of snow accumulated on the Buran, Shatul and Chashil passes by the end of the period. The snowfall was below normal.

Kangra District

Seraj.—About 3' of snow fell on the higher elevations during October. No snowfall occurred in November. During December, the snow line descended to 8,000' a.s.l. and there were fairly heavy snowfalls on the peaks where about 1' of snow accumulated by the end of the period. The snowfall was below normal.

Kulu.—Snowfall did not occur during the period at the station. It snowed frequently on the peaks and passes around. Accumulations at the end of November and December were 11' and 16' respectively on the Hampta peaks while, for the corresponding months, they were 6' and 11' on the Rohtang peaks. The snowfall was below normal.

Mandi District

Mandi.—No snowfall occurred during October and November. One snowfall was reported from the Katula range in December. An accumulation of 2' was observed on the Shikari, Tungari, Raigarh peaks while the accumulation was about 1' on the Bhuboo and Tunga Devi peaks. The snowfall was above normal at higher elevations.

Suket.—Unusually enough, no snowfall occurred during the season.

III.—UTTAR PRADESH

Garhwal.—It snowed on thirteen days in October, seven days in November and four days in December. The depth of accumulations at the end of the period on higher elevations was about 2' to 4'. The snow line was between 8,000' and 11,000' a.s.l. The snowfall was above normal.

Tehri Garhwal.—There was no snowfall during October and November. A few light snowfalls occurred in December on the surrounding high mountains, where the depth of falls was estimated to be more than 6". The snowfall was reported to be below normal during the season.

Almora.—The following table shows the depths of falls during and accumulations at the end of each month :—

Locality	October	November	Decembe
Falls			
Malla Danpur . .	2½' to 7'	Nil	..
Malla Johar . .	3 to 10½'	5 to 12'	..
Malla Darma . .	4½'	5'	..
Accumulations			
Bankatia peak . .	6'	..	16'
Pinder peak . .	6'	..	20'
Pinder valley . .	3'	..	22'
Nanda Khat . .	7'	..	35'
Sunder Dhunga . .	5'	..	18'
Sunder Valley . .	2½'	..	..
Unta Dhung Peak .	6 to 10½'	12'	20'
Ralamdhura . .	..	7'	..
Milam valley . .	..	5'	..
Kotela hill . . .	..	..	5'
Kotela valley . .	..	..	6'
Kafini hill . .	..	..	10'
Kafini valley . .	..	..	12'
Bankatia valley . .	..	..	18'
Nanda valley . .	..	..	30'
Lipuleg . . .	..	..	12'
Limpyaleg . . .	..	..	10'

Snowfalls during the period were largely confine to higher peaks. However, the snowfall was about nor mal in the plains.

Summary

Cold Weather Period, January and February.—Snowfall was below normal in Jammu and Kashmir normal in the Punjab (I) and Uttar Pradesh, and abov normal in Assam.

Hot Weather Period, March to May.—Snowfal was above normal in Jammu and Kashmir and the Pur jab (I), and normal in Uttar Pradesh and Assam.

Monsoon Period, June and July.—Snowfall was nor mal in Jammu and Kashmir, and above normal in th Punjab (I).

Monsoon Period, August and September.—Snowfal was below normal in Jammu and Kashmir, normal i the Punjab (I) and slightly in excess of normal in Utta Pradesh.

Post-Monsoon Period, October to December.—Snowfall was normal in Jammu and Kashmir and Utta Pradesh and above normal in the Punjab (I).

N. B.—It is not possible to adopt a single classification of seaso which will be satisfactory for the whole of India. The classificatio adopted in this publication is, however, considered as the most sati factory one and the least open to objection especially from the point view of rainfall.

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